

Application No. 09/928,294

Response to Non-Final Office Action of April 17, 2007

Amendments to the Drawings:

Replacement Sheet 7 and Annotated Sheet 7 are submitted herewith to provide a reference code Y₃ to the row where finger 12 touches touchscreen 23. No new matter is introduced by this amendment.

Replacement Sheets 3, 16, and 31 and Annotated Sheets were submitted with the RCE dated February 2, 2007. No new matter was introduced by these amendments.

Sheets 34 and 35 (Figures 45–46) were canceled with the RCE dated February 2, 2007.

No official notice was taken of these amendments in the Non-Final Office Action dated April 17, 2007.

There are now a total of 33 drawing sheets pending.

REMARKS / ARGUMENTS

Amendments to Specification and Drawings

Please enter Replacement Sheet 7 (Figures 10 and 11). Fig. 11 is amended to provide a reference Y₃ to the row where finger 12 touches touchscreen 23. A marked-up Annotated Sheet 7 is enclosed. Sheet 7 is dated "June, 2007".

Please enter Replacement Sheets 3, 16, and 31 that were submitted on February 2, 2007, but were not given official notice in the Office Action dated April 17, 2007.

Sheet 3 (Fig. 3) was amended to conform the shape of the handheld game system to the rectangular shape shown in Figures 1, 7, 16, and 39.

Sheet 16 (Fig. 24) was amended to change reference number 146 to 146a at the lower left of Fig. 24, because 146 was duplicated at the far right of Fig. 24. The word controller was amended to handheld and finds support in the last line of paragraph [0086]. Battery 130 was added to Fig. 24 and is implicit in handheld game systems. External memory cartridge 16 was added to Fig. 24 and finds support in Fig. 4. Touchscreen controller 51 was deleted from Fig. 24.

Sheet 31 (Fig. 42) was amended to add Fig. 42a to illustrate prior-art polygon graphics which find support in paragraph [0097] and Fig. 20 "polygons" data.

Applicant respectfully requests that the four Replacement Sheets 3, 7, 16, and 31 be entered. No new matter is introduced by these amendments.

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Claim Rejections - 35 USC §103

Applicant has canceled prior claims 1–374 without disclaimer. Claims 375–394 are added to more clearly define the invention. Claims 375–394 are now pending.

In response to the Office Action mailed April 17, 2007, applicant herewith submits new narrower claims that combine subject matter from canceled dependent claims 353 and 354 (regarding touchscreens) into newly drafted independent claims 375, 388, and 394 which preserve much of the subject matter already examined.

In the Office Action mailed April 17, 2007, independent claim 352 and claims 353 and 354 dependent thereon were rejected under 35 U.S.C 103(a) as unpatentable over PSone (Playstation 1) in view of Aroyan et al. (US 6,163,313).

The PSone document (<http://www.answers.com/topic/playstation-1>) teaches a portable game system of a size and weight that is suitable for handheld use. As stated by the Examiner, the PSone contains a processor in the housing that generates 3D graphical rendering and polygon vertex data to represent a character or object in the game in response to manual input. The PSone lacks a self contained electrical power supply. An LCD screen is provided with the PSone, but lacks touchscreen ability.

Aroyan et al. (US 6,163,313) discloses a touchscreen for use with standard LCD screens (column 2 lines 43–51). The Examiner stated that one of ordinary skill in the art would realize that it is advantageous to provide a screen with a controller on a portable device to enable play without carrying a spare controller and that it would be

obvious for one of ordinary skill in the art to combine the touchscreen with the PSone to increase portability by not having to carry a spare controller.

Applicant's claim 375 is directed to a handheld game system that comprises a touch screen in the housing. For clarity, claim 375 distinguishes the touch sensitive panel input part of the touch screen and the LCD screen output part of the touchscreen.

The claimed handheld game system generates polygon vertex data that represents a simulated 3D player-controlled object in a simulated 3D game space.

The touch sensitive panel detects touched locations in a variable sequence of locations when a physical object (finger, stylus, pencil eraser, etc) moves in contact with the touch sensitive panel which outputs a sequence of 2D coordinates that specify the touched locations.

The 2D coordinates of touched locations are stored in a coordinates memory and converted to 3D spatial coordinates which are stored in the coordinates memory.

The coordinate memory also stores a corresponding sequence of 2D locations around which pixels of the object image are displayed on an LCD screen or similar device. A distinction is made between the input 2D coordinates and the output 2D coordinates because some of the coordinates are different as illustrated in Fig. 11 where the touched location is lower on the touch panel 23 than the $X_2 Y_2$ location on displayed hand 37 because of parallax or object motion, especially after hand 37 or another body part collides with pipe 35 or another object, as described in paragraph [0096]. This is expressed as a limitation in applicant's pending independent claims.

In applicant's claim 375, the polygon processor(s) generates simulated motion of the player object moving through the calculated sequence of 3D coordinates in 3D space and renders the output pixels for display on the LCD showing the player object moving through the sequence of LCD display locations as specified by the 2D display coordinates in the coordinates memory.

The PSone reference describes handheld polygon processing and rendering, and shows an LCD display, as in applicants claim 375 elements (a), (b), and (g).

Aroyan describes a touchscreen which can output touched location data and can control motion of a player object as in applicants claim 375 (c). But the proposed combination of PSone and Aroyan do not show, describe, or remotely suggest the following claim limitations required by applicant's claim 375:

- (1) The game system comprises a coordinates memory for storing a sequence of 2D coordinates of touched locations, a corresponding sequence of 3D spatial coordinates of a player object, and a corresponding sequence of 2D coordinates of display locations on the discrete display device that are different than the 2D coordinates of touched locations.
- (2) A processor converts 2D coordinates of touched panel locations to 3D spatial coordinates of a 3D player object moving in a simulated 3D game space and represented by polygon vertex data generated in a battery powered processor in a handheld game system that is not receiving external electric power.

In order to establish a *prima facie* case of obviousness, all of the claim limitations must be taught or suggested by the prior art. The proposed combination of PSone and Aroyan fails to teach or suggest all of the claim limitations. Therefore, a *prima facie* case of obviousness has not been established.

The Examiner stated that it would be obvious for the PSone to incorporate a self contained battery, although the PSone reference does not teach such a battery. A self contained battery is implicit in handheld game systems, so the issue is moot.

When additional limiting elements, such as conversion of 2D to 3D coordinates are added to claim limitation (2), the combination of limiting elements strengthens the case for non-obviousness of claim 375. The MPEP 706.02(j) rule requires that the combined references must teach or suggest all of the claim limitations to establish a *prima facie* case of obviousness, not just selected elements in the limitations.

To determine whether applicant's invention was obvious or not obvious to those skilled in the art on applicant's priority date of May 10, 2001, it is instructive to look at what those skilled in the art were writing in their patent applications for handheld game systems. The handheld game system Game Boy Advance was described in Miyamoto et al. (US 2002/0165028) hereafter referred to as '028, which has a priority date of May 2, 2001. This date was only 8 days prior to applicant's priority date and therefore reflects the state of the art at that time. The word "polygon" does not appear in Miyamoto '028. Miyamoto is very skilled in the video game art.

The processor for the GameBoy Advance is described in detail in Kawase (US 7,025,677). The image co-processor in the Gameboy Advance (1) in Kawase '677 is a sprite processor and is not shown or described as generating 3-D images from polygon vertex data. The word "polygon" does not appear in Kawase '677. Moreover, the word "polygon" does not appear in several Nintendo US patent applications that describe the Gameboy Advance, such as 2004/0110563, 2004/0106456, 2004/0087369, and 2004/0005928. The Gameboy Advance is an example of the focus on sprites, to the exclusion of polygon graphics, among designers of independently battery powered handheld game systems in May 2001.

If a method for generating player characters using polygon graphics in a battery powered handheld game system were obvious to the Miyamoto '028 inventors, why did they not provide even one example in the drawings or description? This would be a strange omission if it were obvious to adapt the PSone design to independent operation simply by adding a touchscreen and a battery.

In Miyamoto '028, player objects for display on handheld game systems are generated as sprites. If it were obvious to generate 3-D player characters from polygon vertex data for display on handheld game systems, why did Miyamoto choose sprite technology for handhelds instead of the polygon graphics used for his Mario character? Clearly, Miyamoto and his co-inventors did not have a reasonable expectation of success for handheld game systems that would use polygon graphics to generate and display complex three-dimensional characters such as TV-screen versions of Mario and similar complex characters. Because handheld game system use of polygon graphics was unexpected at a time when sprites were the standard technology for handheld game systems, Miyamoto, his co-inventors, and patent counsel did not expect there would be any need to illustrate or describe Mario generated from polygon vertex data for display on handheld game system LCDs in the '028 patent application of Miyamoto et al.

To establish a *prima facie* case of obviousness, there must be a reasonable expectation of success when the teachings of the references are combined as specified by the claim limitations.

Wherever the words “dimension”, “perspective”, “viewpoint”, “camera” and other indicia of three-dimensionality are used in Miyamoto ‘028, they are used only in connection with display on a TV screen, not on handheld independently battery powered game system LCD screens. Examples of 3-D polygon graphics being displayed on such handheld devices are not shown, described, or remotely suggested in Miyamoto ‘028 that exemplifies the handheld game art in May 2001.

The cited references illustrate how game experts overlooked applicant’s invention because they regarded an independently powered handheld game system as a 2-D game system. An example of this mindset may also be found in Aonuma (US 2003/0216177) which shows 3-D characters in Figures 5 and 6 for display on a TV screen, but classifies the Game Boy Advance handheld LCD screen as “a 2-D map screen.” Aonuma refers to the LCD screen as “the 2-D map screen” 38 times, as if handheld LCD screens were necessarily limited to 2-D graphics such as maps.

Aonuma mentions polygons in paragraphs [0004], [0070], and [0081] but only in connection with display on a TV screen. Aonuma does not show, describe, or remotely suggest 3-D polygon graphics or 3-D objects for display on LCD 41. Aonuma’s priority application was filed on May 17, 2002, more than one year after applicant’s priority date. Applicant’s invention was still not obvious one year after applicant filed his priority application.

Because the LCD screens on independently powered handheld game systems were stereotyped as 2-D screens, the possibility of handheld game systems displaying 3-D objects rendered from 3-D polygon vertex data was overlooked. The long-standing assumption in the prior art that independently powered handheld game systems would not generate characters from polygon vertex data, is evidence that applicant’s invention was not obvious on his priority date.

More than two and a half years after applicant's priority date of May 10, 2001, in December 2003 Nintendo began (US 2005/0130738) a series of patent applications for DS handheld systems that use polygon graphics. If it were obvious to use polygon graphics in handhelds in May 2001, Nintendo would not have waited two and a half years to show or describe such improvements in their patent applications for handheld game systems. Applicant's invention was unexpected in May 2001 and assumed to be unworkable with no reasonable expectation of success and therefore not obvious to those of ordinary skill (or extraordinary skill) in the handheld game system art in May 2001.

Applicant's dependent claims are dependent on pending independent claims that are believed to be allowable, and therefore the reasons given in the recent Office Action for rejection of the dependent claims are moot.

For the above reasons, applicant submits that the present pending claims define an invention that was novel, non-obvious, and a significant advance over the prior art on his priority date.

Summary

1. None of the cited references teach or suggest applicant's claim limitation that specifies a coordinates memory for storing 2D coordinates of touched locations that are different than the 2D coordinates of the display locations.
2. None of the cited references teach or suggest applicant's claim limitation that specifies converting 2D coordinates of touched locations to 3D spatial coordinates of a 3D player object and then converting back to 2D coordinates of display locations that are different than the touched locations.
3. None of the cited references teach or suggest applicant's claim limitation that specifies generating polygon vertex data in a handheld game system processor that is powered by a handheld battery when the game system is operated independently of external power sources.
4. Combining the teachings of the cited references would fail to teach or suggest all of applicant's claim limitations.
5. Applicant's invention was not considered as having a reasonable expectation of success by those skilled in the art on applicant's priority date.
6. Applicant's invention was not obvious to people of ordinary skill in the art more than one year after applicant's priority date.
7. A period of more than two and a half years elapsed after applicant's priority date before applicant's invention was reinvented by others.

Applicant submits that the present pending claims are allowable and a favorable decision is respectfully requested.

Respectfully submitted,

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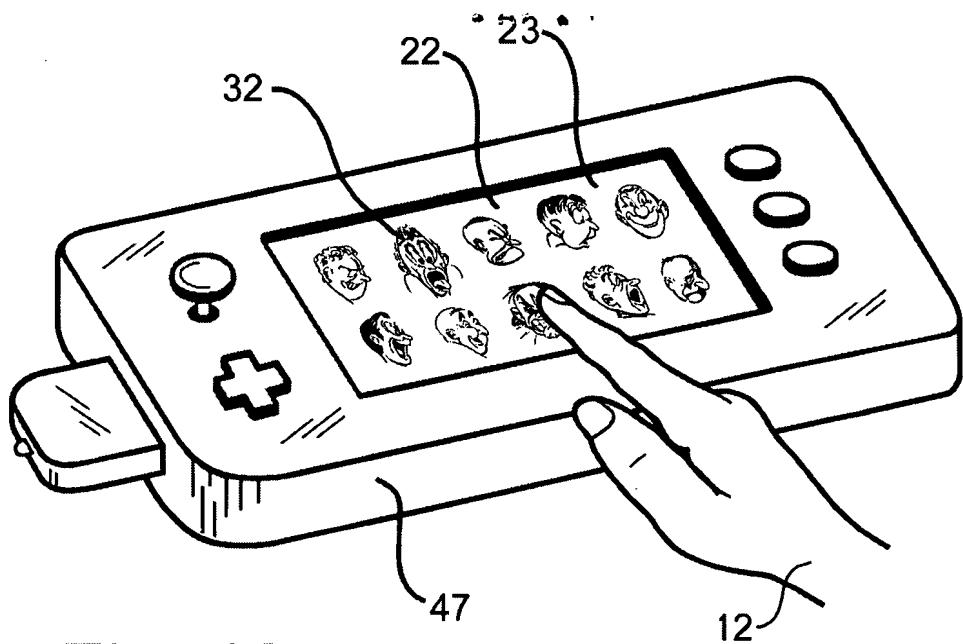


Fig. 10

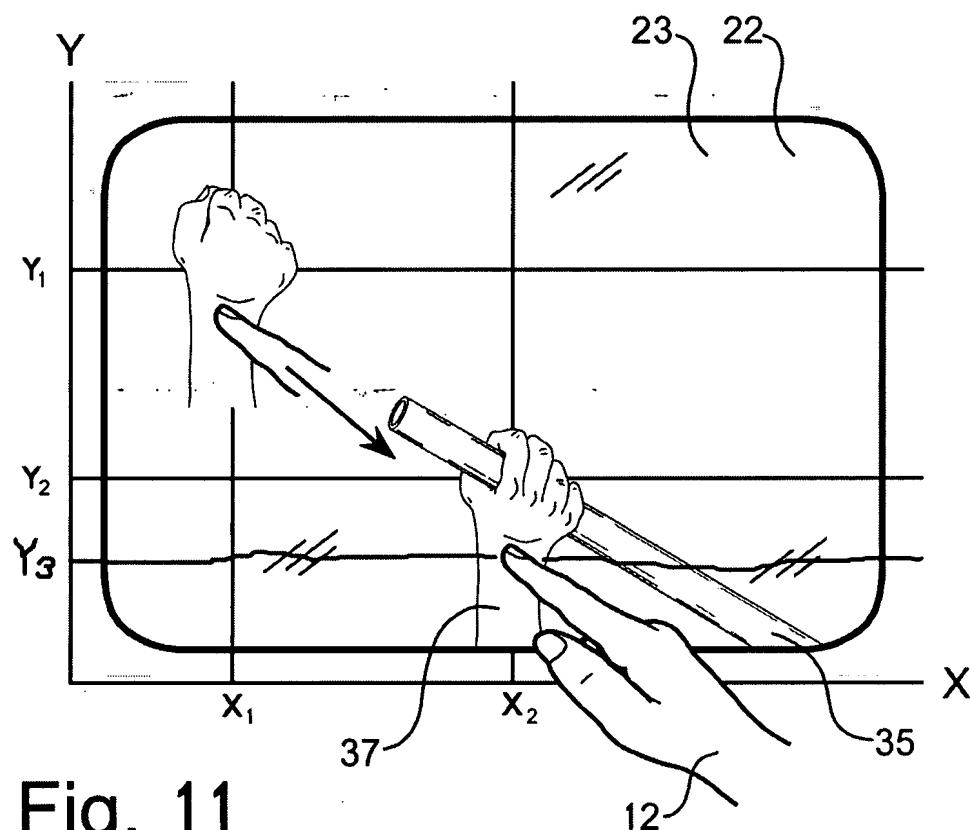


Fig. 11